DOCUMENT RESUME

ED 470 766 CE 084 062

TITLE	Building & Property Maintenance. FasTrak Specialization Integrated Technical and Academic Competency (ITAC). 2002 Revision.
INSTITUTION	Ohio State Dept. of Education, Columbus. Div. of Career-Technical and Adult Education.
PUB DATE	2002-00-00
NOTE	21p.; For other FasTrak ITACs, see ED 457 412, ED 458 376-383, ED 459 318, ED 463 407, and CE 084 063-064.
AVAILABLE FROM	For full text: http://www.ode.state.oh.us/ctae/teacher/fastrak/list.asp.
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Adult Education; Air Conditioning; Air Conditioning Equipment; Blueprints; *Building Operation; Building Trades; Carpentry; Competence; *Competency Based Education; Computer Literacy; Construction (Process); Electrical Systems; Electricians; Employment Opportunities; Employment Qualifications; Equipment Maintenance; Equipment Utilization; Heating; Job Skills; Learning Modules; *Maintenance; Masonry; Occupational Mobility; Plumbing; Promotion (Occupational); Roofing; Safety; Secondary Education; *Statewide Planning; *Trade and Industrial Education; Ventilation; Vocational Education; Welding
IDENTIFIERS	*Career and Technical Education; *Ohio

ABSTRACT

This document presents an overview of the 2-year competency-based building and property maintenance programs offered in Ohio schools at the secondary and/or adult levels. The overview covers the attributes and qualifications required to be a successful worker in the industry and the typical tasks performed by building and property maintenance workers. It also discusses opportunities for advancement and possible occupational ladders in the building and property maintenance field as a whole and in specific occupations in the field. The remainder of the document lists the enabling tasks required for mastery of a total of 64 competencies covered in 12 units of instruction and 1 optional module. The unit topics are as follows: (1) orientation to the building and property management industry; (2) basic safety procedures; (3) basic procedures; (4) computerized property maintenance management systems; (5) blueprints/layout work; (6) masonry applications and repairs; (7) rough carpentry applications and repairs; (8) roof applications and repairs; (9) plumbing installations and repairs; (10) electrical installations and repairs; (11) interior finish/carpentry procedures; (12) heating, ventilation, air conditioning, and components; and (13) welding and cutting operations. (MN)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 470 766

< BACK TO FULL VERSION | MAGNIFY

Acknowledgements
Ohio Department of Education
Career - Technical and Adult Education
2002 Revision

Building & Property Maintenance

Vicki Melvin, Director

Industrial and Engineering Systems and Health Careers

Robert Bowermeister, Assistant Director
Joyce R. Boudreau, Consultant
Michael Cowles, Consultant
Les Brinkley, Consultant
Gayle Parlin, Consultant
Richard Wancho, Consultant

Curriculum Consultants

Dee Allenspach, Consultant
Joyce Leimbach, Consultant

Professional Panel

Randy Combs, Jr., Production Manager,Rockford Homes, Columbus
Mark Garver, BWC, Pickerington
William Guinther, BWC, Pickerington
Mick Harris, Director of Maintenance & Operations, Ohio University, Athens
Andrea Maclam, Associated General Contractors, Columbus
Jean Radcliff, Director of Work Management for Facilities Management, Ohio University, Athens
Harold Ray, Department of Administrative Services, Columbus

Educational Review Panel

Robert Bruner, Guernsey Noble Career Center, MEOVS District, Zanesville
Jim Carper, EHOVE Career Center, Milan
Thomas Fazio, Polaris Career Center, Middleburg Heights
William Hoover, Gordon D. James Career Center, Warren
Rhea Lane III, Columbiana Career Center, Lisbon
Larry Morris, Tri-County Joint Vocational School, Nelsonville

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

J. Bowling

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

2

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

CE084062

Overview
Building and Property Maintenance

The Construction and Maintenance Industries need 240,000 new skilled workers every year. If you have a good aptitude for math, like working with your hands, are creative, and like to solve problems, this may be a career for you. A high school education is desirable, including courses in carpentry, shop, mechanical drawing, and general mathematics. Manual dexterity, eye-hand coordination, physical fitness, and a good sense of balance are important. The ability to solve mathematical problems quickly and accurately is important.

One must be physically fit to be a successful worker in this industry. Much of what is expected requires physical effort. The work is intellectually demanding since it requires foresight, concentration, mathematical skills, and an ability to understand plans and blueprints. You may also be expected to prepare cost estimates for clients or employers and develop written reports or keep maintenance/project records.

Workers employed in the building and property maintenance industry perform a variety of installation and maintenance work. They may replace panes of glass, ceiling tiles, and doors and windows, install partitions, change locks, repair cabinets and perform other interior and exterior replacements and repairs.

Workers in building and property maintenance jobs or remodeling jobs must be able to do all aspects of a job-not just one task. Thus individuals with good basic overall training are at a distinct advantage, because they can switch from residential building to commercial construction or remodeling work, depending on which offers the best work opportunities.

Workers in this industry may advance to maintenance/carpentry supervisor or general construction supervisor positions. Carpenters usually have greater opportunities than most other construction workers to become general construction supervisors, because carpenters are exposed to the entire construction process. Some carpenters become independent contractors. To advance, these workers should be able to estimate the nature and quantity of materials needed to properly complete a job. In addition, they must be able to accurately estimate how long a job should take to complete and what it will cost.

The Building and Property Maintenance programs offered in Ohio schools at

the secondary and/or adult levels are two-year program. Classroom and laboratory learning experiences focus on skills necessary to keep the physical structure of an office building, factory, apartment building, house or similar structure in good repair. Included is instruction in carpentry, concrete work, roofing application and repair, ceramic tile and masonry application and repair; drywall, electrical installation and repair; painting, wallpapering, and plumbing. Instruction in computerized maintenance management programs is provided to help students who find employment in large complexes such as university or office building maintenance.

Building and Property Maintenance

Acknowledgements

Overview

1. Orientation to the Building and Property Management Industry
2. Basic Safety Procedures
3. Basic Procedures
4. Computerized Property Maintenance Management Systems
5. Blue Prints/Layout Work
6. Masonry Applications and Repairs
7. Rough Carpentry Applications and Repairs
8. Roof Applications and Repairs
9. Plumbing Installations and Repairs
10. Electrical Installations and Repairs
11. Interior Finish/Carpentry Procedures
12. Heating, Ventilation, Air-Conditioning, and Components

(Optional Module)

13. Welding and Cutting Operations (Optional Module)

< BACK TO FULL VERSION MAGNIFY

12 Building and Property Maintenance

Unit 1: Orientation to the Building and Property Maintenance

Industry

Competency: Outline the scope of a career in the building and property maintenance industry

1. Present an overview of careers in building and property maintenance
2. Identify areas of specialization and related occupations with building and property maintenance
3. Identify responsibilities of a person working in building and property maintenance
4. Identify characteristics required to work in building and property maintenance
5. Identify professional and/or trade associations related to building and property maintenance

Competency: Identify employment opportunities and training needed to work in building and property maintenance careers

1. Identify education and training required to work in building and property maintenance
2. Match building and property management job titles with qualifications and responsibilities
3. Describe techniques, processes, and procedures a typical building and property maintenance employee would perform

Unit 2: Basic Safety Procedures

Competency: Use personal protective safety equipment in accordance with current Occupational Safety and Health Administration (OSHA), American Confederation of Governmental & Industrial Hygienists (ACGIH) and American National Standards Institute (ANSI) guidelines

1. Wear approved footwear and appropriate hand protection specific to the job being performed
2. Wear hard hat when needed/appropriate
3. Secure long hair
4. Wear job-appropriate clothing
5. Wear job-appropriate eye and hearing protection (e.g., safety glasses, goggles)

BEST COPY AVAILABLE

6. Wear job-appropriate respiratory protection

Competency: Maintain safe environment

1. Maintain floors (e.g., sweep, wash)
2. Remove and dispose of spills
3. Handle blood borne pathogens and body fluids
4. Dispose of waste materials in specified containers
5. Check condition of guardrails, gratings, and flooring
6. Secure/report unsafe conditions
7. Store tools/materials in safe, orderly fashion
8. Maintain air quality
9. Follow safety procedures for working in confined spaces
10. Reinforce positive safe work practices and behavior

Competency: Use safety and fire equipment in accordance with Manufacturers' specifications

1. Conduct routine inspections of safety apparatus and equipment
2. Demonstrate established procedures for the use of safety apparatus and equipment
3. Conduct routine building/property safety inspections
4. Check power sources for potential hazards
5. Shut down power in dangerous situations using power-kill switches
6. Demonstrate lock-out/tag-out procedures
7. Identify the location of emergency flush showers, eye-wash fountains, and first-aid stations
8. Demonstrate basic first-aid techniques
9. Identify location of fire extinguishers
10. Demonstrate knowledge of how to operate fire extinguishers
11. Select fire extinguisher appropriate for given class of fire
12. Identify location of a fire
13. Assess severity of a fire
14. Take action appropriate to given fire situation (e.g., suppress minor fire, activate alarm, report)

Competency: Handle hazardous materials in accordance with Materials Safety Data Sheets (MSDS) guidelines and Environmental Protection Agency (EPA) guidelines

1. Identify the location of Materials Safety Data Sheets (MSDSs)
2. Interpret MSDS information for each hazardous material
3. Select substance handling procedure and safety apparatus in accordance with MSDS guidelines
4. Dispose of hazardous materials in accordance with Environmental Protection Agency (EPA) specifications
5. Interpret labeling color codes for hazardous materials

6. Clean leaks and/or spills in accordance with Environmental Protection Agency (EPA) guidelines

Competency: Respond to emergency/safety signals

1. Interpret emergency/safety signs
2. Interpret audible alarms (e.g., horns, bells, whistles, sirens)
3. Interpret warning lights
4. Take action appropriate to given emergency situation

Competency: Protect workers from ergonomic injuries

1. Identify work habits that ensure healthy ergonomic practices
2. Identify repetitive motion activities that might cause injury
3. Maintain posture to prevent injuries (e.g., on a job site, at a computer)
4. Lift/transport objects and materials in accordance with established safe practices

Competency: Follow safety procedures for working around vehicles

1. Interpret vehicle warning signals and alarms
2. Yield right-of-way to vehicles
3. Remain visible
4. Maintain safe distance from vehicles
5. Stay clear of suspended loads

Competency: Follow safety procedures for working on ladders and scaffolds

1. Select ladder appropriate for given application (e.g., type, working length)
2. Ensure secure footing for ladders
3. Position ladders at safe angle and required height
4. Tie off ladders
5. Reposition ladders
6. Ascend/descend ladders using established procedure (e.g., maintaining 3-point contact and facing the ladder)
7. Wear fall-arrest system
8. Assemble scaffolds according to National Center for Construction Education and Research (NCCER) guidelines
9. Secure scaffolds
10. Level scaffolds
11. Reposition scaffolds
12. Dismount scaffolds using established procedure (e.g., maintaining 3-point contact)
13. Demonstrate safe use of roof jacks, ladder jacks and pump jacks

Unit 3: Basic Procedures

Competency: Handle tools and equipment in accordance with manufacturers' specifications and Occupational Safety and Health Administration (OSHA) guidelines for safety

1. Identify potential hazards associated with hand tools
2. Demonstrate the safe use of hand tools
3. Check hand tools before, during, and after use
4. Identify potential hazards associated with power tools and equipment
5. Identify proper sizing and uses of extension cords (e.g., Ground Fault Circuits Interpreters (GFCI)
6. Demonstrate safe handling, lifting, and carrying methods
7. Demonstrate established procedures for operating power tools and power equipment
8. Check power equipment before, during, and after use
9. Maintain tools and equipment in accordance with professional standards

Competency: Use basic hand and power tools in accordance with established procedures and safety guidelines

1. Demonstrate procedures for the setup, operation, and maintenance of hand tools
2. Demonstrate procedures for the setup, operation, and maintenance of power-operated hand tools
3. Demonstrate procedures for the setup, operation, and maintenance of stationary power tools
4. Demonstrate procedures for the setup, operation, and maintenance of pneumatic, gas, and powder-activated tools
5. Perform measuring, layout, and squaring tasks using various layout tools

Competency: Perform preventive maintenance in accordance with guidelines specified by manufacturer and/or outside authorities with jurisdiction (e.g., building inspectors, zoning inspectors)

1. Establish operating and maintenance records
2. Access needed information from past maintenance records
3. Follow preventive maintenance schedule
4. Access needed information using preventive maintenance manuals
5. Log preventive maintenance performed

Competency: Troubleshoot maintenance problems in accordance with established procedures

1. Diagnose maintenance problem

2. Obtain all available information about given maintenance problem
3. Perform multisensory inspections
4. Perform operational checks
5. Access needed information using specifications manuals
6. Access needed information from maintenance records
7. Identify specific problem(s)
8. Document maintenance problem(s)

Competency: Perform job-related math functions

1. Perform basic math functions without a calculator (e.g., add, subtract, multiply, and divide numbers)
2. Perform calculations involving decimals and fractions
3. Change numbers to percentages
4. Perform math functions using a hand-held basic-function calculator
5. Measure with accuracy distances or sizes using a ruler or tape measure
6. Compute feet, inches, and yards
7. Change hours and minutes to decimals, fractions, and mixed numbers
8. Calculate ratios and proportions, area, volume, and diameter
9. Convert measurements from English to metric and from metric to English
10. Calculate time charged for labor on a job
11. Solve job-related problems using mathematical handbooks, charts, and tables

Unit 4: Computer Property Maintenance Management Systems

Competency: Demonstrate computer technology skills

1. Identify computer software used to manage property maintenance
2. Demonstrate basic computer skills (e.g., input information, create, copy, and save files, use spell check, and use security codes)

Competency: Identify various computer programs available for property management

1. Research products, services, and information on the Internet
2. Demonstrate knowledge of a basic computerized property management system

Unit 5: Blueprint/Layout Work

Competency: Interpret construction drawings

1. Identify types of drawings and specifications
2. Identify common scales used in construction drawings

3. Determine actual measurements based on given scale
4. Identify information concerning construction features and their relationship using sections and details
5. Interpret symbols
6. Identify general construction information not clearly indicated by the dimensions using schedules
7. Identify how the work will be performed, materials, and finishes to be used, and worker responsibilities using building specifications
8. Interpret site plans
9. Follow code compliant construction

Competency: Demonstrate layout and measuring procedures

1. Demonstrate accurate fundamentals in squaring techniques
2. Demonstrate accurate plumb and leveling techniques
3. Demonstrate basic use for manual and electronic layout equipment (e.g., transit, laser level, builder's level)
4. Install batter boards
5. Square building corners
6. Locate building corners

Unit 6: Masonry Applications and Repairs

Competency: Construct forms for various concrete work

1. Calculate material and equipment requirements
2. Construct forms
3. Install concrete reinforcing material
4. Remove forms
5. Maintain forms (e.g., clean, scrape, disassemble)

Competency: Mix Concrete

1. Determine concrete requirements (air entraining, additives, bag mix)
2. Determine ratio and proportions
3. Measure ingredients
4. Mix concrete using hand and power method

Competency: Pour concrete masonry slabs and foundations

1. Determine job requirements and estimate materials needed
2. Pour masonry slabs
3. Pour masonry foundations

Competency: Waterproof and/or repair foundations and apply exterior finishes in accordance with existing codes

1. Select waterproofing material and drainage system appropriate for given job
2. Clean walls
3. Fill holes with selected material
4. Apply selected material to foundations
5. Install drainage systems
6. Apply brick, cement, and stucco finishes

Competency: Mix mortar

1. Select mortar type
2. Determine measures/proportions
3. Measure materials
4. Mix mortar using hand and power methods

Competency: Install/repair rowlock windowsills in accordance with project specifications

1. Prepare job site
2. Cut brick to size
3. Lay brick to specified dimensions
4. Maintain degree of slope
5. Maintain uniform joints
6. Maintain plumb
7. Tool joints to match existing joints

Competency: Repair brick jambs in accordance with project specifications

1. Prepare job site
2. Lay out stretcher
3. Lay jamb units to specified dimensions
4. Maintain bond
5. Maintain level and plumb
6. Tool joints to match existing brick work

Competency: Replace brick lintels in accordance with project specifications

1. Prepare job site
2. Identify types of lintels
3. Determine lintel removal method appropriate for given job including safety measures
4. Position lintels
5. Set lintels
6. Paint lintels as necessary

Competency: Set window frames in brick accordance with project specifications

1. Prepare job site
2. Determine job requirements and estimate materials needed
3. Check trueness of masonry units already set using a level
4. Clean sash slots
5. Interpret blueprints
6. Install windows
7. Install lintels
8. Install sills

Competency: Set door frames in brick accordance with project specifications

1. Prepare job site
2. Determine job requirements and estimate materials needed
3. Check trueness of masonry units already set using a level
4. Interpret blueprints
5. Install temporary bracing in rough openings
6. Install lintels
7. Install door frames and anchors

Competency: Build brick and block walls in accordance with project specifications

1. Interpret blueprints
2. Prepare job site
3. Determine job requirements and estimate materials needed
4. Lay brick and block
5. Install reinforcing
6. Parge/waterproof walls

Competency: Apply caulking

1. Determine job requirements and estimate materials needed
2. Identify reasons for caulking
3. Match types of caulking to specific uses
4. Replace caulking in expansion joints

Competency: Demonstrate knowledge of the procedures for cleaning masonry surfaces

1. Determine job requirements and estimate materials needed
2. Identify reasons for cleaning masonry surfaces
3. Identify methods of wall cleaning

4. Identify cleaning equipment
5. Identify types of cleaning material
6. Identify the safety precautions to be followed when cleaning masonry surfaces (e.g., check MSDS)

Competency: Maintain exterior walkways and steps

1. Determine job requirements and estimate materials needed
2. Repair stone and concrete steps
3. Repair concrete walkways
4. Repair asphalt walkways
5. Repair stone walkways
6. Repaint stone and concrete steps

Unit 7: Rough Carpentry Applications and Repairs

Competency: Use instruments and tools for layout work

1. Measure regular and irregular shapes using a measuring tape
2. Perform measuring and layout tasks using appropriate tools
3. Establish plumb, square and level using appropriate tools
4. Lay out building locations and alignment using optical and laser builder's level

Competency: Construct floor systems in accordance with project specifications

1. Determine job requirements and estimate materials needed
2. Install sills and sill sealers
3. Erect girders, beams, and columns
4. Install floor joists in accordance with applicable codes and existing construction standards
5. Install bridging in accordance with existing codes
6. Install sub flooring

Competency: Construct wall systems according to project specifications

1. Determine job requirements and estimate materials needed
2. Layout walls and rough openings
3. Assemble walls using wood or metal framing
4. Install wall sheathing
5. Erect sections
6. Install bracing and wall sheathing

Competency: Construct ceiling and roof systems according to project

specifications

1. Determine job requirements and estimate materials needed
2. Install ceiling joists/rafters, and/or truss system
3. Install sub-fascia
4. Install roof sheathing

Competency: Install new or replacement exterior finishes in accordance with original construction

1. Determine job requirements and estimate materials needed
2. Install/replace cornice materials (i.e., fascia, soffits, soffit vents, moldings, frieze board)
3. Install/replace or repair exterior walls finishes (e.g., wood siding, vinyl siding, aluminum siding, stucco)
4. Install new or replacement gutters and downspouts in accordance with manufacturer's specifications and existing codes
5. Install new and replacement doors, windows, locks, and hardware in accordance with project specifications and existing codes
6. Repair doors, windows, and screens in accordance with project specifications
7. Install shutters in accordance with project specifications

Unit 8: Roofing Applications and Repairs

Competency: Install sloped roof covering system in accordance with project specifications

1. Determine job requirements and estimate materials needed
2. Prepare roof deck (i.e., drip edges, flashing, underlayment)
3. Assemble materials for drip edges and eaves flashing
4. Bend drip edges to fit pitch of roof
5. Install roofing materials (i.e., asphalt, metal, wood, fiberglass, tile, slate shingles)
6. Install flashing

Competency: Install roof vent systems

1. Determine job requirements and estimate materials needed
2. Install roof ventilators (i.e., passive and active vents)

Competency: Install flat roof systems in accordance with project specifications

1. Determine job requirements and estimate materials needed
2. Prepare roof deck

3. Assemble materials for eaves flashing
4. Install roofing materials (i.e., asphalt, metal, wood, fiberglass, tile, slate shingles)
5. Install flashing

Unit 9: Plumbing Installations and Repairs

Competency: Install plumbing systems in accordance with manufacturers' specifications and local codes

1. Determine job requirements and estimate materials needed
2. Demonstrate connecting pipes (i.e., vinyl, plastic, copper, steel)

Competency: Install plumbing fixtures in accordance with manufacturers' specifications and local codes

1. Interpret drawings
2. Install water closets
3. Install sinks
4. Install faucet assemblies
5. Install tubs and shower enclosures
6. Connect drains and traps
7. Install electric and gas water heaters
8. Perform air tests for leaks
9. Insulate pipes
10. Install disposal units
11. Connect icemakers

Competency: Maintain plumbing installations in accordance with manufacturers' specifications and existing codes

1. Open clogged drains
2. Repair copper pipe
3. Repair PVC pipe
4. Repair faucets and valves
5. Change water filters and screens
6. Regulate water levels, pressures, and temperatures
7. Repair water closet components
8. Replace water closet components
9. Replace traps

Unit 10: Electrical Installations and Repairs

Competency: Apply knowledge of the National Electric Code (NEC)

1. Locate required information in the NEC

2. Select materials in accordance with the NEC
3. Select methods in accordance with the NEC
4. Select applications in accordance with the NEC
5. Select applicable safety procedures in accordance with the NEC
6. Interpret local codes

Competency: Install electrical systems to meet local codes

1. Interpret drawings and specifications
2. Plan/lay out jobs
3. Install rough-in wiring in accordance with the NEC and local codes
4. Install finish wiring in accordance with the NEC and local codes

Competency: Maintain electrical systems in accordance with building blueprint specifications, the NEC, and local codes

1. Use test equipment in accordance with manufacturers' directions
2. Trace circuits to locate problems

Unit 11: Interior Finish/Carpentry Procedures

Competency: Install thermal insulation and vapor barriers in accordance with local codes

1. Follow project specifications
2. Determine job requirements for insulated or super-insulated structures
3. Select materials and fasteners
4. Install insulation in accordance with manufacturers' specifications and Occupational Safety and Health Administration (OSHA) guidelines
5. Install inner vapor barriers
6. Install crawl space vapor barriers

Competency: Install and replace interior walls, ceilings, and finishes

1. Follow project specifications
2. Determine job requirements and estimate needed materials
3. Install new or replacement drywall in accordance with existing codes
4. Install new or replacement wall paneling in accordance with manufacturers' specifications
5. Install/replace or repair suspended ceilings in accordance with manufacturers' specifications

Competency: Apply paint and special wall finishes

1. Prepare the work site
2. Prepare surfaces to be painted

3. Prepare paint in accordance with manufacturer's specifications
4. Apply paint to interior and exterior surfaces in accordance with manufacturer's specifications
5. Use painting equipment and tools in accordance with established operation and maintenance procedures
6. Apply wood finishes in accordance with manufacturer's specifications
7. Apply metal finishes in accordance with manufacturer's specifications
8. Apply special finishes in accordance with manufacturer's specifications

Competency: Hang wall coverings in accordance with manufacturers' specifications

1. Select wall-covering materials appropriate for given job and estimate materials needed
2. Prepare surfaces for wall coverings
3. Hang interior wall coverings
4. Hang borders

Competency: Install/replace sections of tile

1. Determine job requirements and estimate materials needed
2. Prepare surfaces and substructures
3. Install wall ceramics
4. Install floor ceramics

Competency: Maintain ceramic tile surfaces

1. Prepare surfaces
2. Reset loose tiles
3. Regrout tiles
4. Reseal surfaces

Competency: Maintain ceilings and interior walls

1. Determine job requirements
2. Repair tears in wall coverings
3. Patch plaster
4. Select cleaning products appropriate to given surface
5. Apply cleaning products in accordance with manufacturer's specifications

Competency: Install/replace or repair finish flooring in accordance with Manufacturers' specifications

1. Follow project specifications
2. Determine job requirements and estimate materials needed

3. Prepare sub-floor
4. Install finish flooring (e.g., wood, carpet, ceramic, vinyl, concrete)
5. Repair flooring (e.g., vinyl, ceramic, concrete) and sub-flooring

Competency: Install new or replacement baseboards moldings and interior trim in accordance with project specifications

1. Determine job requirements and estimate materials needed
2. Install baseboards and moldings (i.e., rails, casings, crown moldings, and chair rails)

Competency: Install new or replacement cabinets in accordance with project specifications

1. Follow project specifications
2. Determine job requirements and estimate materials needed
3. Install wall and base cabinets, hardware and accessories
4. Install countertops

Competency: Install garage door and power units in accordance with Manufacturers' specifications

1. Select garage door units
2. Construct garage door frames
3. Position garage door units
4. Attach garage door units
5. Install garage door power unit

Competency: Install porches, decks, and steps in accordance with codes and project specifications

1. Follow project specifications
2. Determine job requirements and estimate materials needed
3. Assemble/install deck (i.e., foundation, set posts, joists, railings, steps)
4. Lay out deck perimeters in accordance with job specifications
5. Assemble decks (i.e., posts, decking, railing)
6. Lay out rise and run
7. Layout and assemble stairs

Unit 12: Heating, Ventilation, Air-Conditioning, and Components (Optional Module)

Competency: Identify various HVAC system controls

1. Demonstrate knowledge of various types of HVAC equipment and systems

2. Identify various types of controls, HVAC systems, and building automation systems

Competency: Repair refrigeration units in accordance with applicable codes and Environmental Protection Agency (EPA) guidelines

1. Access needed information using operator's manuals and determine job requirements
2. Perform required tests using gauges, meters, and valves
3. Evacuate and charge system

Competency: Maintain heating, ventilation, and air-conditioning systems and components in accordance with manufacturers' specifications

1. Access needed information using operator's manuals and determine job requirements
2. Perform preventive maintenance tasks
3. Replace filters, belts, clean, lubricate and repair components
4. Troubleshoot forced-air or gas control systems
5. Report malfunctioning units to appropriate personnel
6. Verify that there is complete combustion
7. Adjust dampers
8. Verify that there is an adequate supply of fuel
9. Verify that there is a correct mix of gas
10. Clean ducts and accessories
11. Shut down systems as required

Competency: Maintain compressors

1. Determine job requirements, tools, and materials needed
2. Monitor operating compressor (e.g., check for leaks or unusual smells, read gauges, check for buildup on and obstructions to switches and controls, check cooling system)
3. Perform running and scheduled maintenance
4. Report malfunctions units to appropriate personnel

Unit 13: Welding and Cutting Operations (Optional Module)

Competency: Use arc welding equipment

1. Wear personal safety apparatus in accordance with Occupational Safety and Health Administration (OSHA) standards
2. Determine arc welding tools, equipment, and materials
3. Weld with arc welding equipment
4. Cut with arc welding equipment

5. Maintain welding equipment

Competency: Use oxyacetylene welding equipment

1. Wear personal safety apparatus in accordance with OSHA standards
2. Determine oxyacetylene welding tools, equipment, and materials
3. Determine fire prevention methods needed
4. Weld with oxyacetylene welding equipment
5. Cut with oxyacetylene welding equipment
6. Maintain welding equipment

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

X	This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.
	This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").